ORIGINAL RESEARCH PAPER

Volume-7 | Issue-6 | June-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

NUTRITIONAL IMPORTANCE ON ORAL HEALTH: A REVIEW

Dental Science

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ABSTRACT

Nutrition is a process of how food affects the body. Nutrition represents a summation of intake, absorption, storage and utilization of food by the tissues. It is the adequate provision of materials like vitamins, minerals, fiber, water and food components to cells and organisms to support life. Many common health problems can be prevented or alleviated with good nutrition. The roles that nutrition plays in general and oral health in particular are many and increasingly complex. It is often overlooked yet obvious fact that the health of the oral cavity and that of the total body are intimately interrelated. Dentistry today is changing to meet the needs of a changing population. Life expectancy continues to increase and the nature and demographics of oral disease are changing associated oral conditions such as coronal caries, root caries, periodontal caries, edentulism, cancer, acquired immune deficiency syndrome (AIDS) and oral infections, all have nutritional implications.

KEYWORDS

Dentistry, Oral health, Nutrition

Introduction

The health of the oral cavity is critical to general health and nutritional status. The unique characteristics of oral tissues make them more sensitive to nutrient variability than other parts of the body, and thus early indicators of physiological problems.[1] Many nutritional deficiencies and toxicities are first manifest in the oral cavity before signs appear elsewhere. Oral soft tissue has a more rapid turnover time (3 to7 days) than other body tissues. This is thought to be an adaptation over time to the many assaults that the oral cavity is subjected to on a daily basis (e.g., hot foods, cold foods, eating utensils)"Although association between foods and disease have been recognized and reported for centuries, only in the 20th century were most nutrients isolated and their function and mechanism of action determined.[2]

The science of nutrition has also evolved in focus. In the past years, the focus was on determining what and how much of various nutrients and foods the body needs to prevent nutritional deficiencies. By the 1950's, dietary deficiency diseases were largely eradicated in developed countries. Even in developing countries, deficiencies result from problems of agriculture, economics, and food policy and distribution. Of the 10 leading causes of death today, first have poor diet as a risk factor and then heart disease, stroke, diabetes, liver disease, and some cancers. In today's world nutrition act as a tool in helping prevent chronic diseases and prolong life. Food and food components that can help prevent cancers, heart disease, and other degenerative conditions are actively researched.[3]

Advanced in food engineering and technology have also resulted in greater potential to manipulate foods to meet nutritional goals. Genetic engineering has resulted in lower fat meats, tomatoes with good flavor year-round, and virus-resistant squash. Fortification can be used to boost the amount of nutrients normally found in foods and to add nutrients to foods that do not usually contain them. Nutritional supplement has grown from encompassing primarily vitamins and minerals, including to herbals, phytochemicals, diet drugs, and other such supplement. As a result, the line between nutrients as food and nutrients as pharmaceutical or medicine is becoming blurred.[3,4]

The Process of Nutrition

Digestion of food begins in the oral cavity, where both physical and chemical digestion begins.[3] Oral digestion is short (about 30 seconds) as compared to gastric and intestinal digestion (1 to 10 hours), so its importance is often overlooked and neglected. However oral digestion has an important impact on overall digestion and may influence the entire digestive process, including the metabolic response to starches. Mechanical digestion begins with the process of biting and chewing food. Breaking foods into particles ensures that pieces will be small enough to be swallowed safely. In addition, the smaller pieces of food provide more surface area for saliva to aid in propelling food to esophagus and for digestive enzymes to function. In the mouth, the only chemical digestion is the action of amylase on starches. The mechanism is particularly important to dentistry in that it allows large molecule starches, which are not fermentable by plaque acids, to be hydrolyzed into shorter chain carbohydrate that are fermentable. This mechanism accounts for the cariogenic potential of starches.[1,3]

Stomach

In the stomach, the cardiac sphincter modulates the entrance of food into the stomach. Goblet cells produce mucus to protect stomach lining from the acid. Chief cells produce pepsinogen which helps initiate the hydrolysis of protein with the aid of HCL. Parietal cells in the stomach wall release HCL to make gastric content acidic. Parietal cells also secrete intrinsic factor, the protein that facilitates the absorption of vitamin B12. This stomach acid also halts the action of amylase on starches. The acidic food mass that moves on to the small intestine is called chyme.[5]

Small Intestine

The majority of food digestion occurs in the duodenum of the small intestine, from which nutrients are absorbed.[3]The pyloric valve moderate the entry of chyme into the duodenum. There digestive enzymes from the intestinal cell wall and some from the pancreas act to hydrolyze foods into absorbable nutrients. "Three classes of enzymes-carbohydrate, lipases and proteases catalyze the hydrolysis of the energy providing nutrients. Bile from the gallbladder emulsifies fat and makes it accessible to lipase. As chyme moves along the small intestine, nutrients are hydrolyzed to their final absorbable component: monosaccharides, amino acids, fatty acids and glycerol. By the time it reaches the end of the small intestine, it has been exposed to more than 200 m^2 of intestinal surface area where all nutrients with the expectation of water and some minerals are absorbed. The small intestine is lined with 4 to 5 million fingerlike projections called villi. Each villus has a layer of epithelium over a layer of connective tissue (lamina propria), which is supplied with capillaries for blood circulation and lacteals for lymph circulation. On the surface of each villus is the brush border, which is composed of 500 to 600 microvilli.[6] Absorption can be either active or passive. Active absorption requires carriers to help move nutrients across the brush border. Passive absorption occurs when nutrients move from an area of greater concentration in the intestine to an area of lesser concentration in the circulation without the assistance of carriers. Absorption is a selective process by which the body can help protect itself from deficiencies or excesses. Once absorbed, nutrients move to the liver and then to all cells.[3]

Storage

Energy derived from food is stored for the short term as ATP (adenosine triphosphate) in cells, intermediately as glycogen in the liver, and long term as fat in adipose tissue. Fat soluble vitamins are stored in adipose tissue as well. Protein, iron and vitamin A are stored in the liver. Many of the minerals are stored in the bone. Water soluble vitamin s are not stored but are found in greater amounts in depots throughout the body. All nutrients are undergoing active metabolism. Even "stored" nutrients are constantly being used up and replenished. [7]

Large intestine

The large intestine encompasses the cecum, colon, rectum, and anal canal. By the time the food reaches the large intestine, most digestion and absorption have been completed. Undigested food components move on the large intestine, where water and minerals are reabsorbed. No digestive activity takes place in the large intestine. However, bacteria attack undigested residues to assist in elimination. Solid waste is formed into feces and excreted via the rectum and anus. [3]

Excretion

Excretion is the elimination of undigested by products of food and other substances such as toxins, bacteria, and sloughed off body cells. [8,9] There are four organs of excretion:

Skin:

Eliminates water via perspiration, and small amounts of some minerals and nitrogenous waste.

Lungs:

Eliminate carbon dioxide and water.

Kidneys:

Eliminate most nitrogenous waste, water, minerals, excess water-soluble vitamins and detoxified substances.

Bowel:

Eliminates undigested food and indigestible fiber, bile pigments, intestinal bacteria, and other metabolic by products. [3,10]

Conclusion

Nutrition is the process of how food affects the body. It is the adequate provision of materials like vitamins, minerals, fiber, water and other food components to cell and organism to support life. There is an inter-dependent relationship between nutrition and health of oral tissues. A nutritious diet, including adequate amounts of protein, vitamins, essential fatty acids and micronutrients plays an important role in the resistance to infectious conditions including dental caries and periodontitis.

References

1. Nizel A E, Papas A S. Nutrition in Clinical Dentistry. 3rd Edition. W B Saundars Company;1989: 13-214.
2. Peter S. Essentials of preventive and community dentistry. 6th edition. Aryamedi publishing house Pvt. Ltd; 2017:2-488.
3. Park k. Park's Text book of Preventive and social medicine. 24nd edition. M/s Banarsidas Bhanot ;2017: 383-614.
4. Satyanarayan U. Biochemistry.Carbohydrates.1st Edition. Books and Allied Pvt. Ltd; 2000: 1-72.
5. Depaola D, Faire M, Palmer C. Nutrition in Relation to Dental Medicine. 9th Edition. Baltiinore: Williams & Wilkins,1999.
6. Palmer A. Diet & Nutrition in oral health. New Jersey; 2003:1-322.
7. Hoebler C, Karinithi A, Devaux M F. Physical and Chemical Transformation of Cereal Food During Oral Digestion in Human Subjects. British Journal of Nutrition. 1998; 80: 429-6.
8. Ehizele AO, Ojehanon PI, Akhinkax O. Nutrition and oral health. Journal of postgraduate medicine. 2009; 11(1): 76 -82.
9. Agbelusi G A. Effects of nutrition on oral health. Niger Med J. 2010; 51(3): 128-30.
10. Johnsen D C, Pappas R L, Cannon D, Goodman J S. Social factors and diet diaries of caries free and high caries 2 to 7 years old's presenting for dental care in West Virginia. Journal of pediatric dentistry.1980; 2(4): 279-86.